

Papaya Fungicide Research Update

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Because of the combination of high susceptibility of the papaya cultivars grown in Hawaii and the environmental conditions being highly conducive for disease development, the Hawaii papaya industry must continue to rely on fungicides to economically produce a crop. The industry still relies heavily on mancozeb for the prevention of the major postharvest fruit diseases as well as blight caused by *Phytophthora palmivora*.

Although mancozeb was reinstated for use on papaya in February 1992, there is still concern for residues of ethylene bisdithiocarbamate (EBDC) and ethylene thiourea (ETU) on sprayed papayas. One area of work we have been involved in was to identify chemicals that papaya fruits could be treated with to reduce the levels of EBDC and ETU. Sodium hydroxide, sodium carbonate, sodium hypochlorite (Clorox), EDTA, and calcium hypochlorite were found to be safe to use in a five-minute dip at 8,000 ppm. A preliminary test using 1,000 ppm of calcium hypochlorite reduced the EBDC level by about 65 percent. Reduction of ETU levels was not determined.

Alternatives to Mancozeb

Anilazine (Dyrene). Anilazine was, until recently, registered for strawberries, green onions, celery, tomatoes, potatoes, and a number of other food products. Although it does not have activity against phytophthora, it has good activity against colletotrichum (anthracnose). In field trials, anilazine looked good, but it began to show phytotoxic effects after the sixth week at 1 lb and 2 lb per acre applied once every 14 days. The manufacturer recently canceled all Dyrene registrations.

Chlorothalonil (Bravo). Chlorothalonil is still registered for use on papaya but sprayed fruits have a tendency to become scalded when exposed to quarantine heat treatments. Three different

formulations (Bravo W75, Bravo 720, and ASC 66518) were tested under field conditions at Malama-ki Research Station but all three formulations caused scalding when treated fruits were vapor-heat treated. The Bravo W75 caused the least scalding. Two safeners, "Red Top" and UAP-M9911 were tested under field conditions to neutralize the scalding effects of chlorothalonil. Neither of these two products proved effective in reducing scalding.

Metalexyl-copper (Ridomil-copper). The protocol for residue testing was finally approved by the IR-4 in September 1993. The manufacturer, Ciba-Geigy Corp., also approved the protocol but directed that the number of applications be reduced from six to four during any 26-week period. Residue studies should begin during the summer of 1994.

Fluazinam. Earlier testing identified fluazinam as a possible alternative to mancozeb because of its broad-spectrum activity. It is non-systemic, has activity against phytophthora and colletotrichum (and many other fungi), but it does not have any food crop registration yet. Field tests at Malama-ki Research Station showed it to be less effective against anthracnose than mancozeb or chlorothalonil. Beginning about the sixth week after the start of spraying, fruits began to show phytotoxic symptoms. Symptoms consisted of small, dark, depressed spots on the fruit surface.

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